

Fig. 1

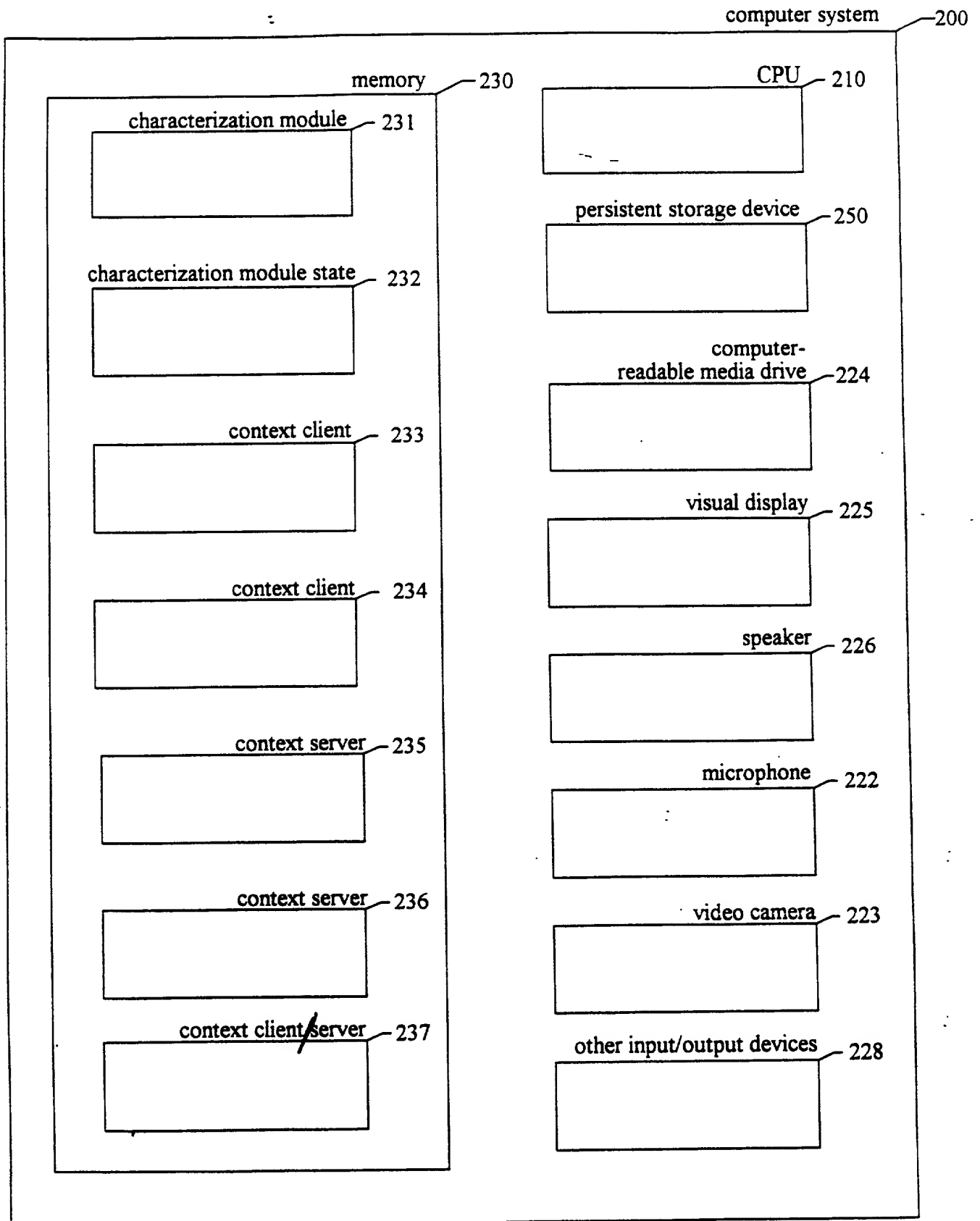
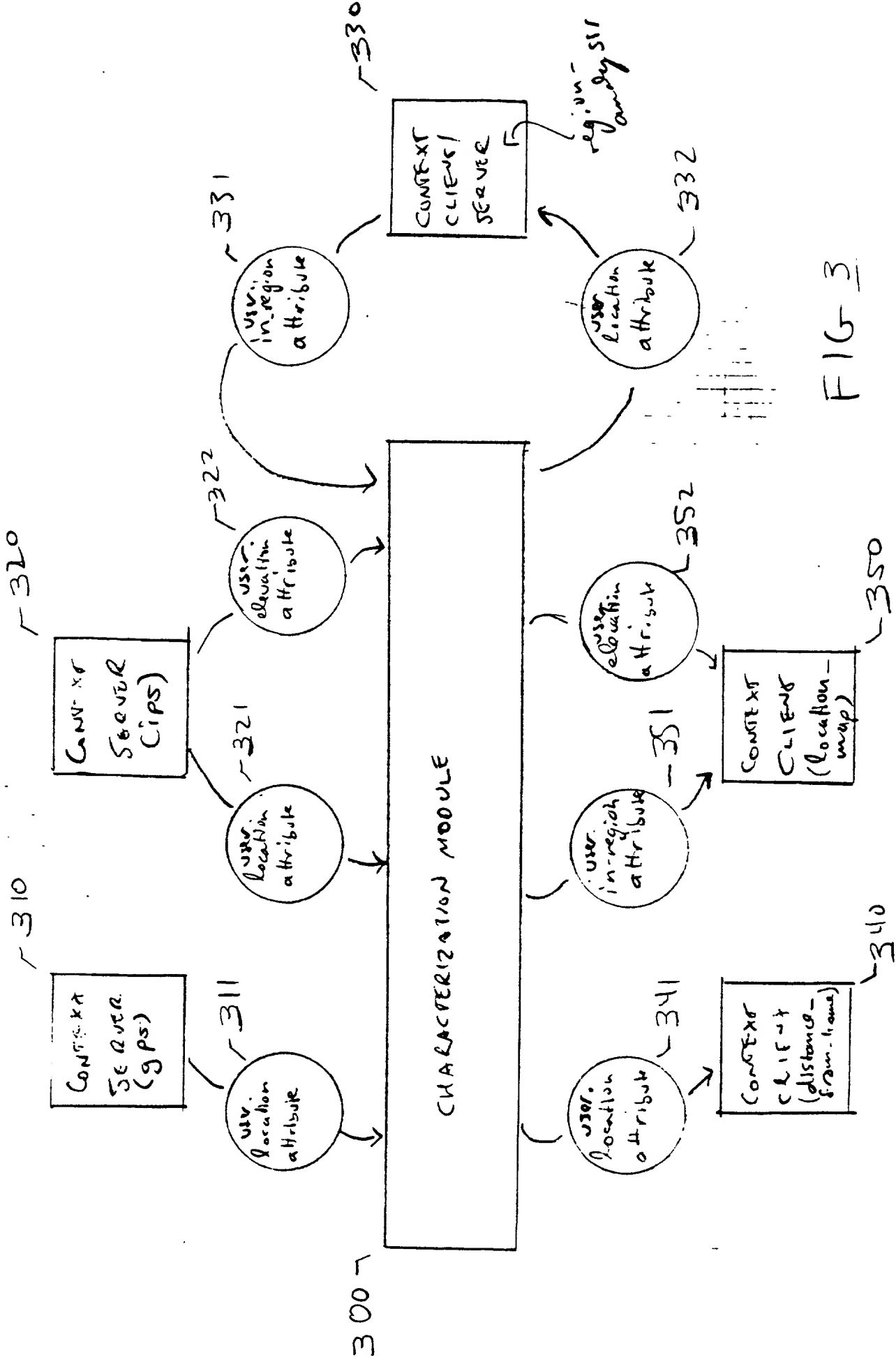


Fig. 2



context server table 400

context server name	version	installation date	filename	request handler
gps	1	2/10/2000	gps.exe	(reference)
ips	1	2/21/2000	ips.exe	(reference)
location_region_analysis	1	2/10/2000	l r a.exe	(reference)

FIG 4

attribute instance table 500

attribute name	context server name	value	uncertainty	timestamp	units	number of context clients consuming
user.location	gps	47° 38.73' N, 122° 18.43' W	0° 09'	13:11:04.023 2/22/2000	degrees/minutes	2
user.location	ips	47° 38.745' N, 122° 18.424' W	0° 021'	13:11:01.118 2/22/2000	degrees/minutes	2
user.elevation	ips	22	.5	13:11:01.118 2/22/2000	meters	1
user.in_region	location_region_analysis	none	none	none	none	0

FIG 5

600

context client table	
context client name	message handler
location_map	(reference)
distance_from_home	(reference)
region_analysis	(reference)

601
602
603

612

611

FIG 6

700

attribute instance table					
attribute name	context server name	value	uncertainty	timestamp	units
user.location	gps	47° 38.73' N, 122° 18.43' W	0° 09'	13:11:04.023 2/22/2000	degrees/minutes
user.location	ips	47° 38.745' N, 122° 18.424' W	0° 021'	13:11:01.118 2/22/2000	degrees/minutes
user.elevation	ips	22	.5	13:11:01.118 2/22/2000	meters
user.in_region	location_region_analysis	none	none	none	none

701
702
703
704

711 712 713 714 715 716 717

FIG 7

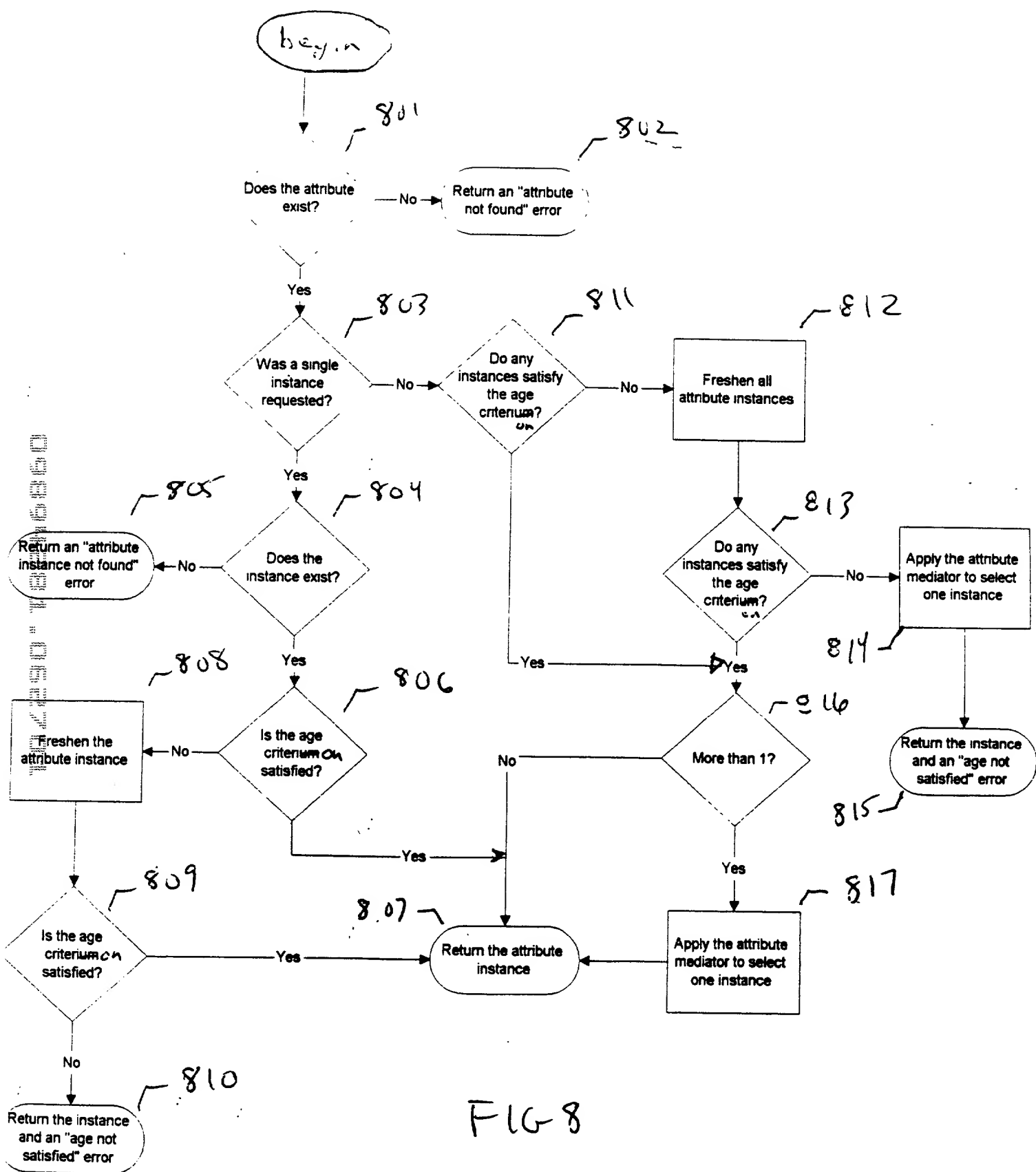


FIG 8

attribute instance table

attribute name	context server name	value	uncertainty	timestamp	units	number of context clients consuming
user.location	gps	47° 38.73' N, 122° 18.43' W	0° .09'	13:11:04.023 2/22/2000	degrees/minutes	2
user.location	ips	47° 38.745' N, 122° 18.424' W	0° .021'	13:11:01.118 2/22/2000	degrees/minutes	2
user.elevation	ips	22.25	.5	13:11:06.565 2/22/2000	meters	1
user.in region	region analysis	none	none	none	none	1

FIG 9

condition table

condition name	context client name	first logical parameter	second logical parameter	comparison value	logical operator
in region true	region analysis	user.in region	none	TRUE	=

FIG 10

FIG. 11

condition monitor table

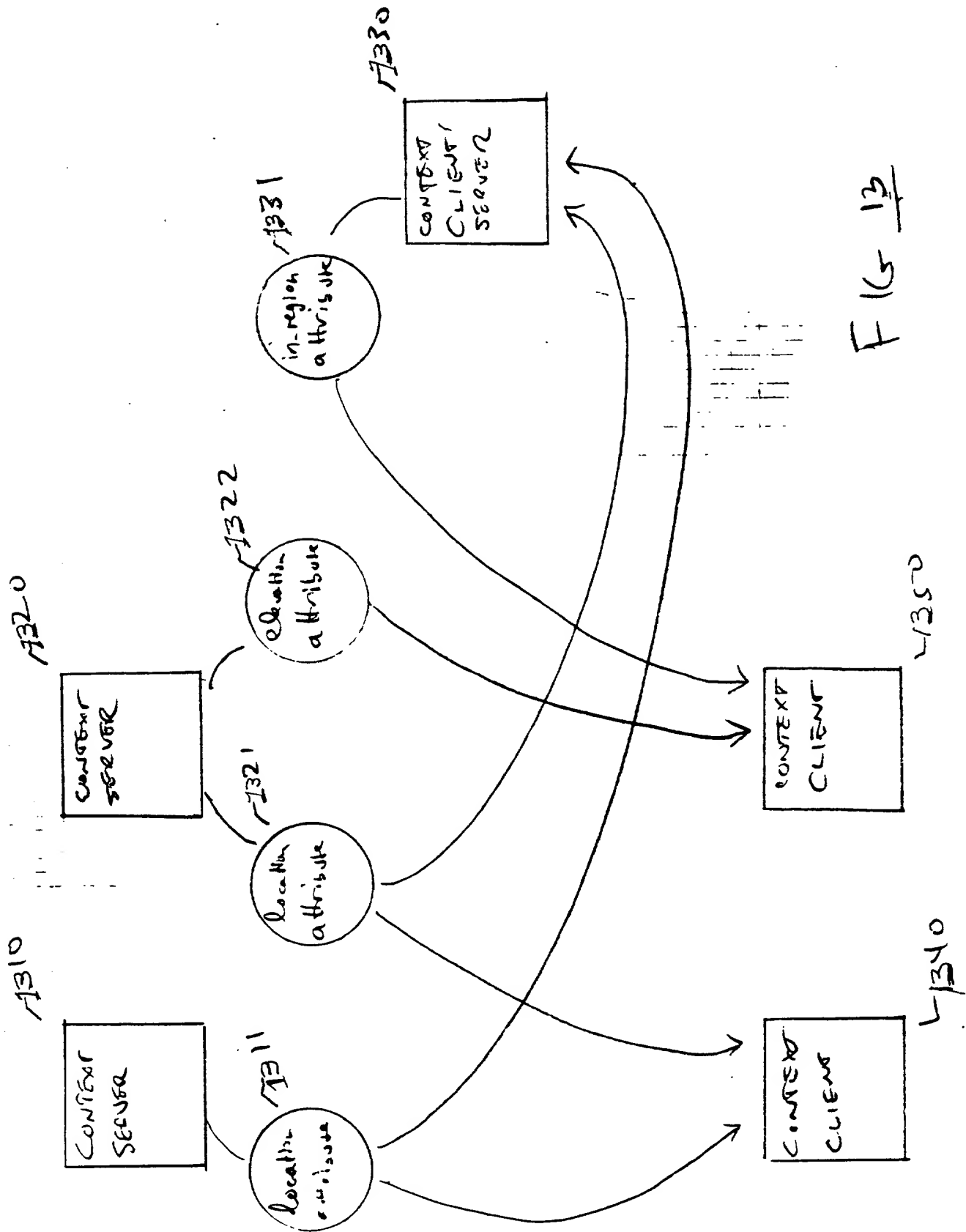
condition monitor name	context client name	condition name	behavior	frequency	condition last evaluated	trigger handler reference	stopped
region_boundaries_crossed	region_analysis	in_region_true	TRUE or FALSE	30	13:11:29.101 2/22/2000	(reference)	no

FIG. 11

condition monitor table

condition monitor name	context client name	condition name	behavior	frequency	condition last evaluated	trigger handler reference	stopped
region_boundaries_crossed	region_analysis	in_region_true	TRUE or FALSE	30	13:11:59.101 2/22/2000	(reference)	yes

FIG. 12



attribute request table

	attribute name	context client name
1401 ~	user.location	distance_from_home
1402 ~	user.in_region	location_map
1403 ~	user.location [gps]	location_region_analysis
1404 ~	user.elevation	location_map

1411

Figure 14

1412

20220716 15:00

User.

Desired_privacy_level
 Interruptibility
 Speed
 Direction
 Acceleration
 Availability.
 Cognitive_availability
 Tactile_availability
 Manual_availability
 Visual_availability
 Oral_availability
 Auditory_availability
 Proximity.<Item or place name>
 Mood.
 Happiness
 Sadness
 Anger
 Frustration
 Confusion
 Activity.
 Driving
 Eating
 Running
 Sleeping
 Talking
 Typing
 Walking
 Location.
 Place_name
 Latitude
 Longitude
 Altitude
 Room
 Floor
 Building
 Address
 Street
 City
 County
 State
 Country
 Postal_Code
 Destination. (same as User.Location.)
 Physiology.
 Pulse
 Body_temperature
 Blood_pressure
 Respiration

Person.<name or ID>. (same as User.)

Platform.**UI.**

Oral_input_device_availability
 Manual_input_device_availability
 Tactile_output_device_availability
 Visual_output_device_availability
 Auditory_output_device_availability

Platform. (continued)**CPU.**

Load
 Speed

Memory.

Total_capacity
 Used

Storage.

Total_capacity
 Used

Connectivity.

Connection_status
 Connection_speed
 Connection_type/device
 Connection_activity

Power.

Power_source
 Power_level

Environment.**People.**

Nearest
 Number_present
 Number_close

Local.

Time
 Date
 Temperature
 Pressure
 Wind_speed
 Wind_direction
 Absolute_humidity
 High_forecast_temperature
 Low_forecast_temperature
 People_present
 Ambient_noise_level
 Ambient_light_level
 Days.<previous or future>.
 High_temperature
 Low_temperature
 Precipitation_type
 Precipitation_amount

Place.<place name>. (same as Environment.Local)

Application.**Mail.**

Available
 New_messages_waiting
 Messages_waiting_to_be_sent

Phone.

Available
 In_use
 On/off
 Notification_mechanism
 Call_incoming
 Caller_ID

Sound_recorder.

Available
 Recording

Fig. 15

- 1) User Setting
- a) Mental Context
 - i) Meaning
 - ii) Cognition
 - (1) Divided User Attention
 - (2) Task Switching
 - (3) Background Awareness
 - iii) Solitude
 - iv) Privacy
 - (1) Desired Privacy
 - (2) Perceived Privacy
 - v) Social Context
 - vi) Affect
 - b) Physical Situation
 - i) Body
 - (1) Biometrics
 - (2) Posture
 - (3) Motion
 - (4) Physical Encumbrment
 - (a) Senses
 - (i) Eyes
 - (ii) Ears
 - (iii) Tactile
 - (iv) Hands
 - (v) Nose
 - (vi) Tongue
 - (b) Workload demands/effects
 - (c) Interaction with computer devices
 - (d) Interaction with people
 - (e) Physical Health
 - ii) Environment
 - (1) Time/Space
 - (2) Objects
 - (3) Persons
 - (a) Audience/Privacy Availability
 - (i) Scope of Disclosure
 - (ii) Hardware affinity for privacy
 - (iii) Privacy Indicator for User
 - (iv) Privacy Indicator for Public
 - (v) Watching Indicator
 - (vi) Being Observed Indicator
 - (4) Ambient Interference
 - (a) Visual
 - (b) Audio
 - (c) Tactile
- 2) Computer
- a) Power
 - b) Configuration
 - i) User Input Systems
 - (1) Hand/Haptic
 - (a) Keyboard/Keystrokes
 - (2) Voice/Audio
 - (3) Eye Tracking
 - (4) Cursors
 - (a) Axis
 - (b) Resolution
 - (i) Selection
 - (ii) Invocation
 - (c) Accelerators
 - ii) Output Systems
 - (1) Visual
 - (a) Resolution
 - (2) Audio
 - (a) Public/Private
 - (3) Haptic
 - iii) External Resources
 - (1) I/O devices
 - (2) Connectivity
 - c) Data
 - i) Quantity/State
 - ii) Urgency/Importance
 - (1) Use of Prominence
 - iii) Modality
 - iv) Sensitivity/Purpose
 - (1) Privacy Issues
 - (2) Use of Association
 - (3) Use of Safety
 - v) Source/Ownership
 - (1) Types
 - (a) User generated
 - (b) Other computers or people
 - (c) Sensor
 - (d) PC State
 - (2) Use of Association

Fig. 16

Fig. 17

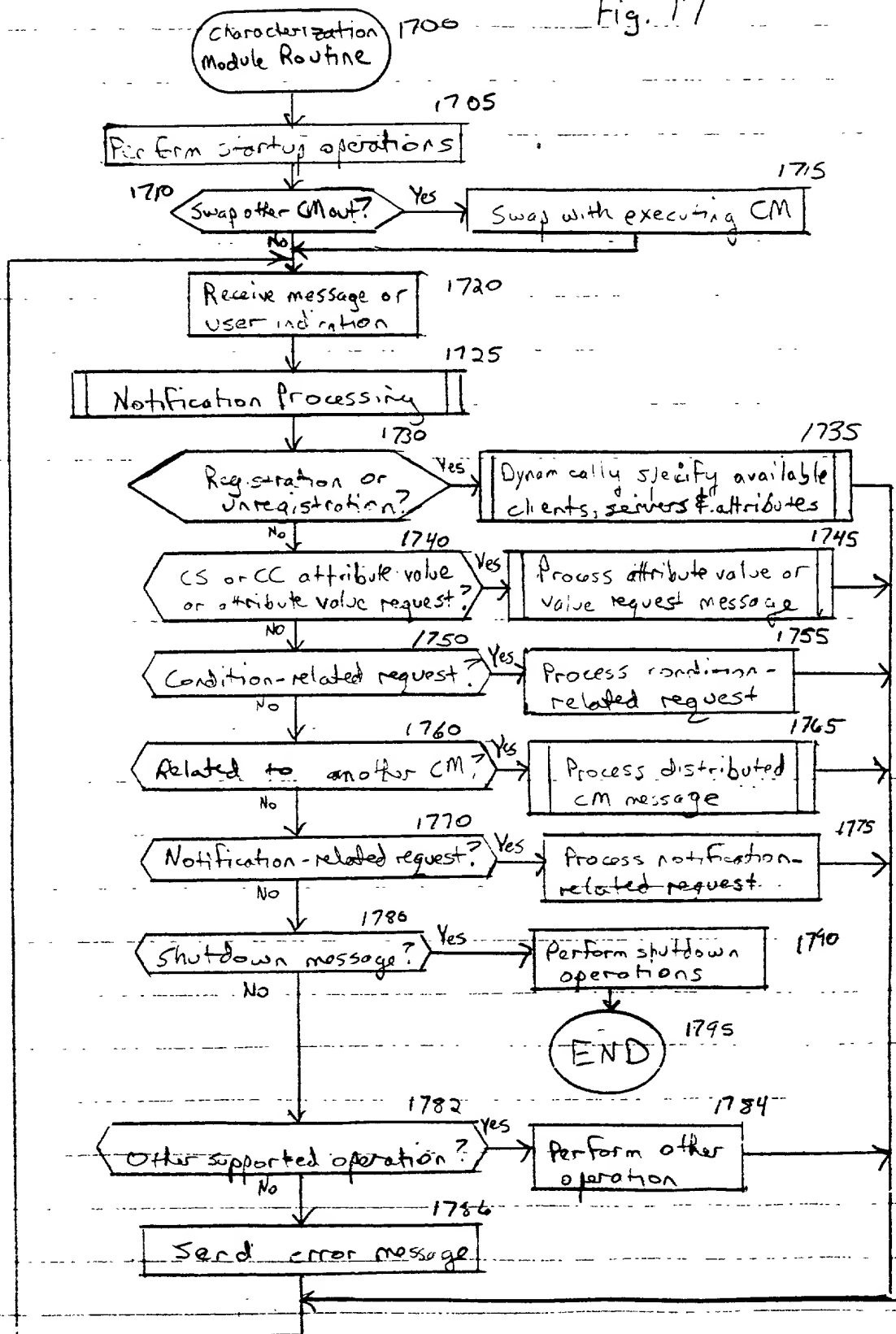


Fig. 18

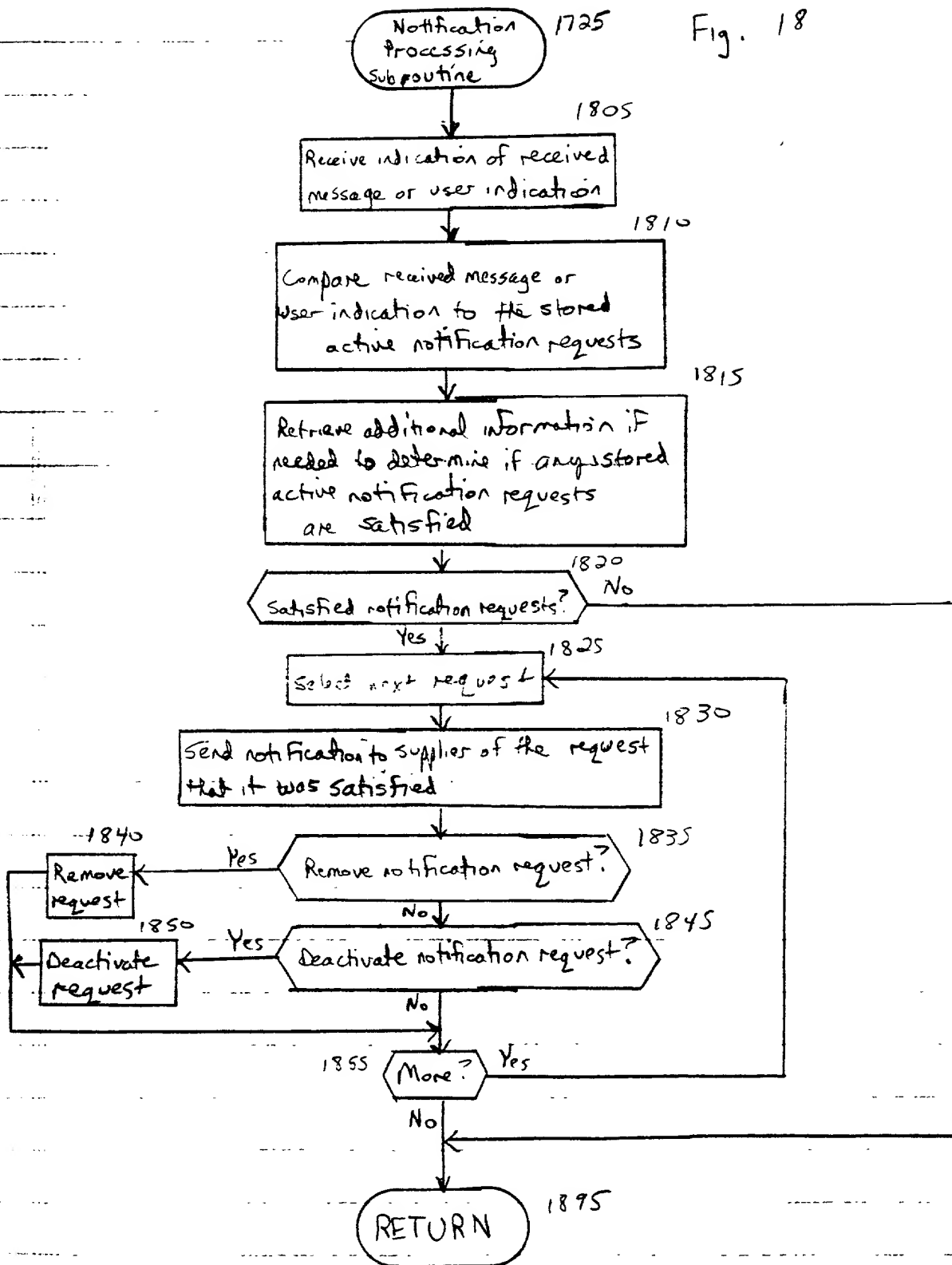


Fig. 19

Dynamically Specify Available
Clients, Servers, & Attributes
Subroutine

Receive a registration or
unregistration message

Need security approval?

Determine if security
is satisfied

satisfied?

Send
error
message

Related to ?

client

server

attributes

Register?

Register new
client if
possible

Error?

Send error
message

Attributes
included to
register?

Unregister
client

Unregister?

Any currently
registered attributes
for the client?

Register?

Select next
attribute

Attribute exists?

Register new
attribute
instance

Register new
attribute

More?

Unregister?

Unregister each
attribute

Register?

Register new
server if
possible

Attributes
included
to register?

Error?

Send error
message

Unregister?

Unregister
Server

Any currently
registered attributes
for the server?

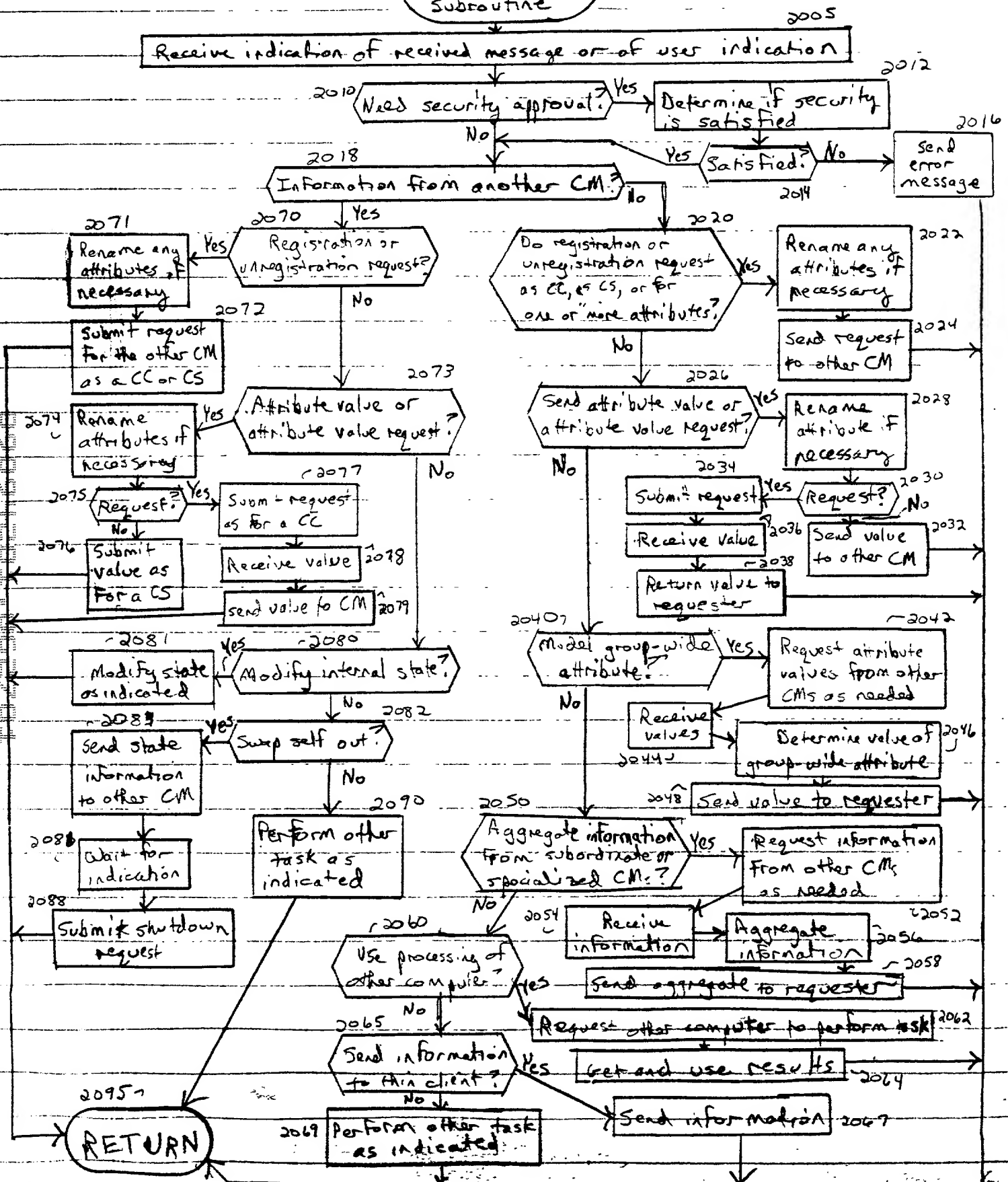
RETURN

1023073369

Process Distributed CM Message Subroutine

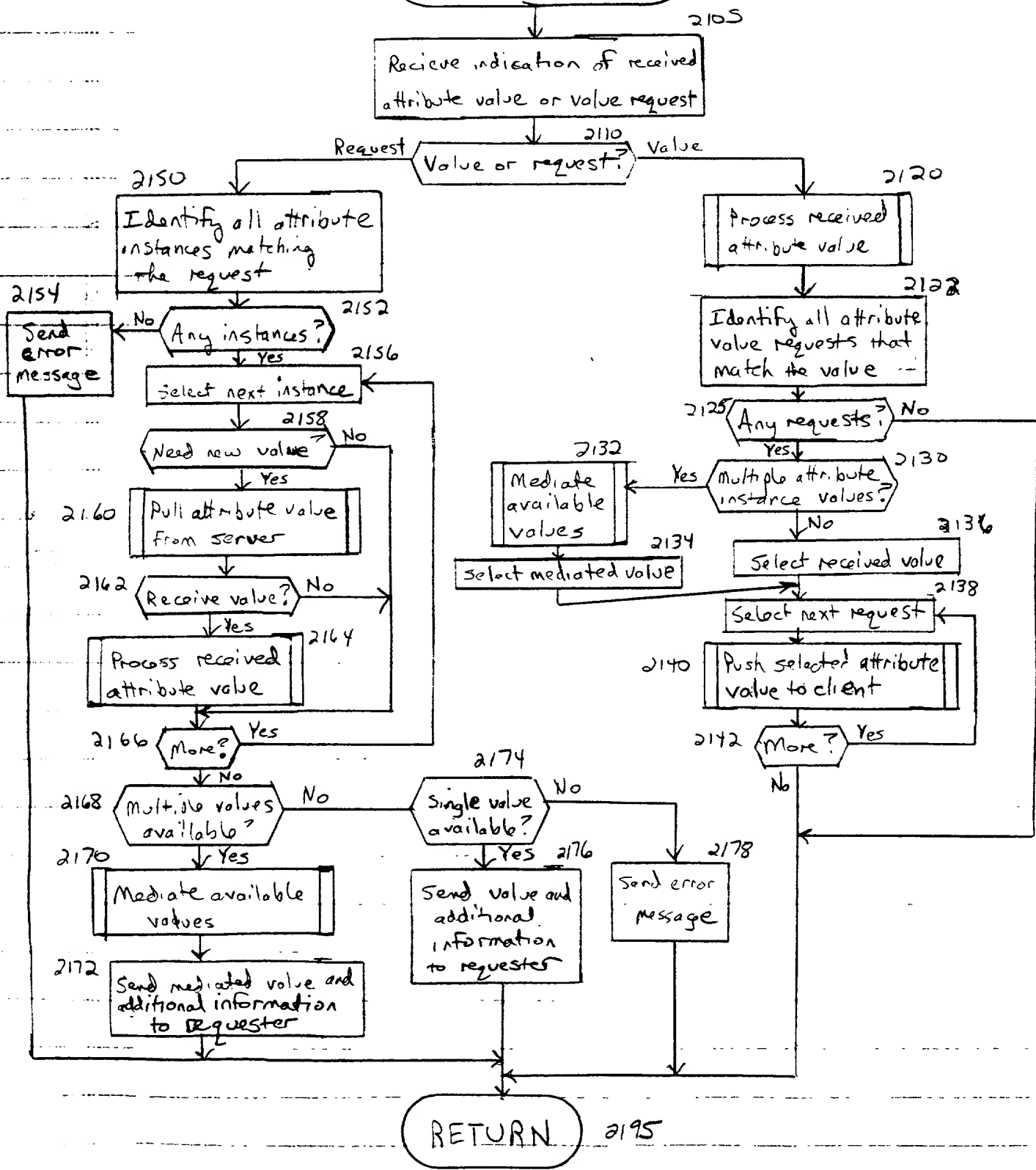
1765

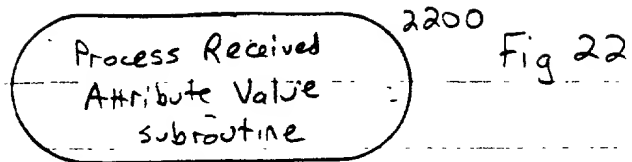
Fig. 20



Process Attribute Value Or Value Request Message Subroutine

Fig. 21





2205

Receive indication of received attribute value

2215

Send error message

2210

Attribute registered?

2220

Additional information?

2225

Process additional information about received value

2230

Cache value?

2235

Cache value and any additional information

2240

Store value?

2245

Store value and any additional information

2250

Determine if value and any additional information triggers any stored active conditions

2255

Any conditions?

2260

Select next condition

2265

Send message to creator of the condition of its satisfaction

2270

Remove condition?

2275

Remove condition

2280

Deactivate condition?

2285

Deactivate condition

2290

more?

2295

RETURN

Fig. 23

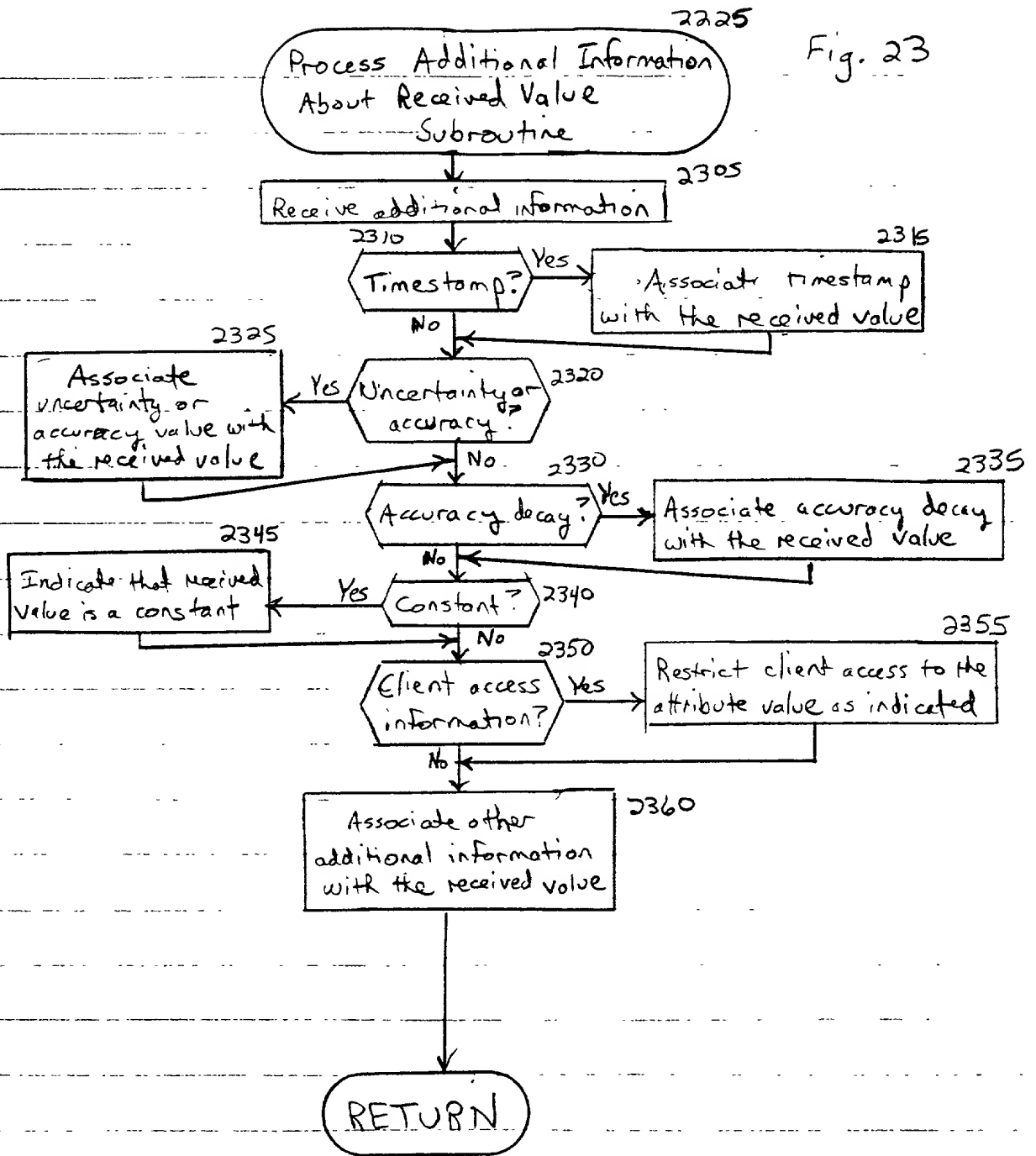
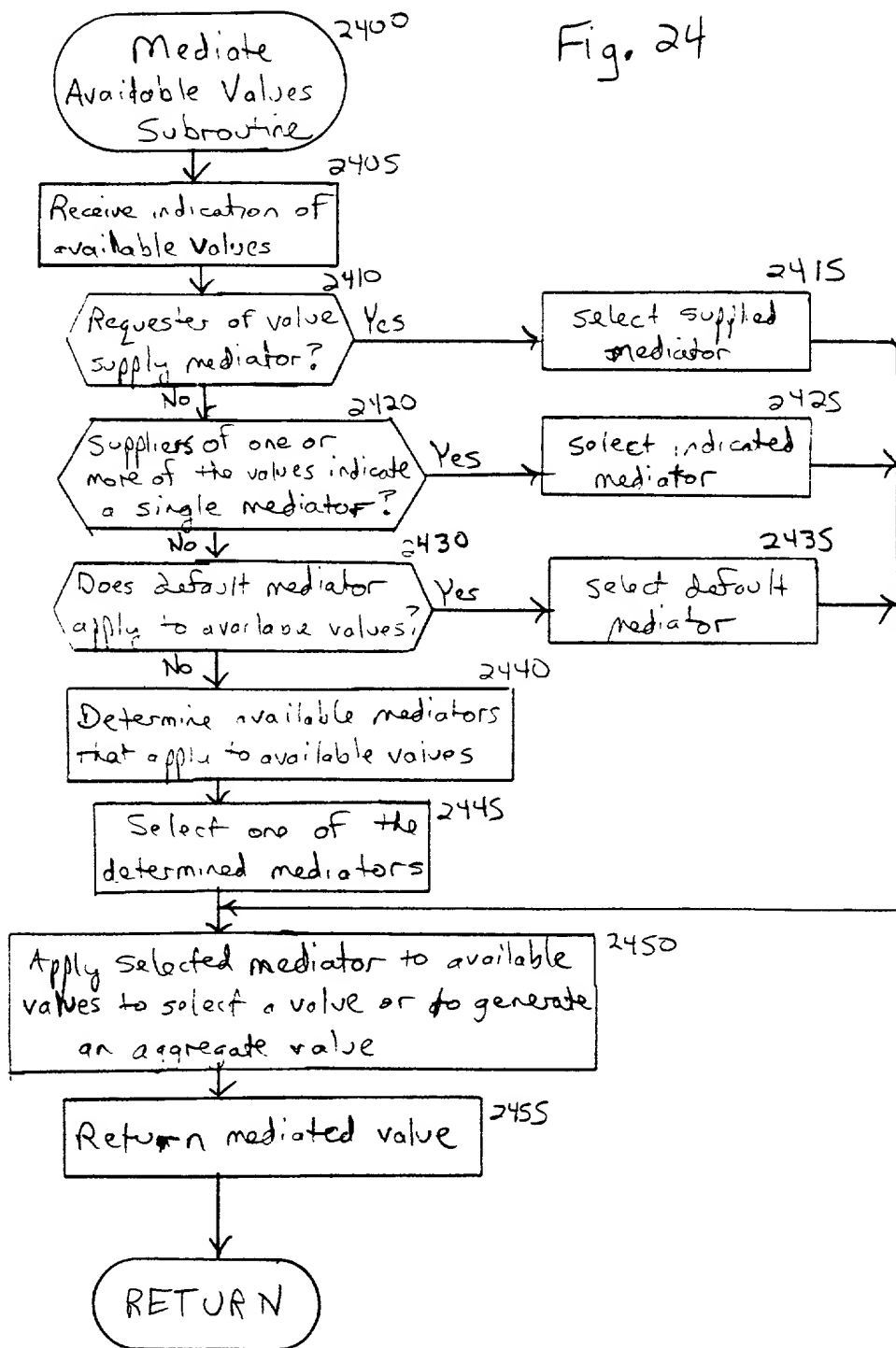
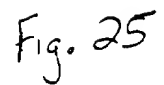


Fig. 24





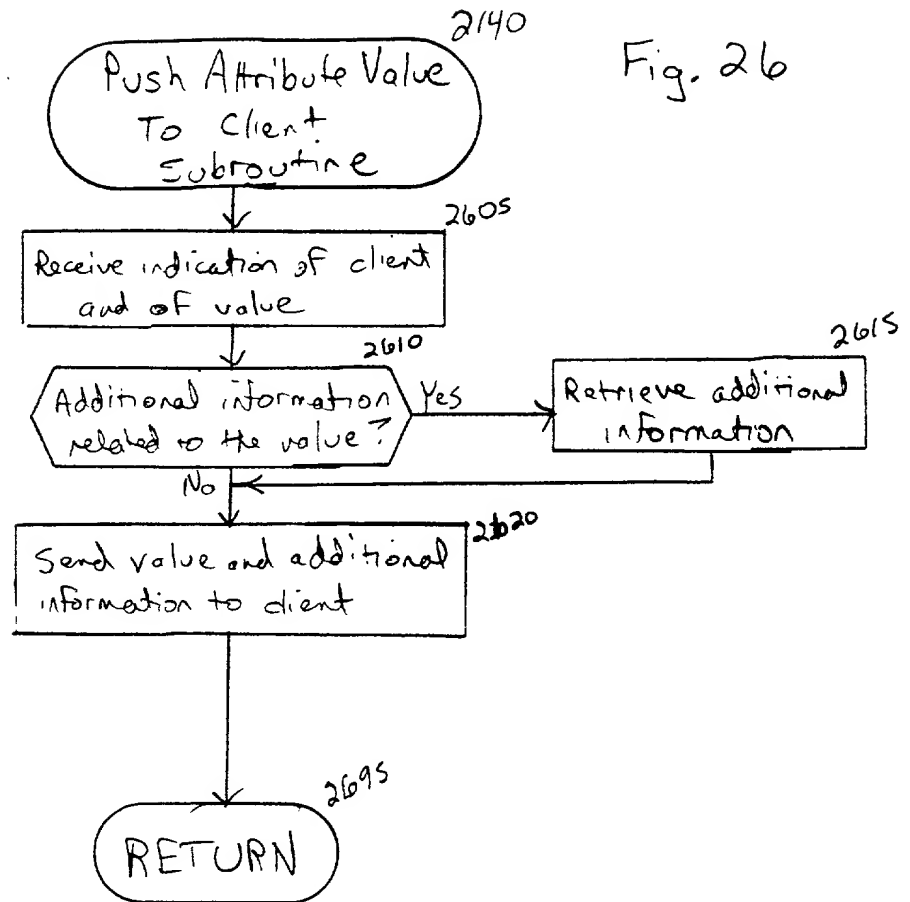


Fig. 27

Context Client Routine 2700

Register with CM 2702

Register for one or more attributes of interest 2704

Receive indication of an instruction or of information received 2706

Instruction or information? 2708

Send notification-related request? 2740

Send condition-related request? 2744

Send attribute value request? 2748

Send other request? 2752

Perform other instruction 2762

Request attribute value 2750

Wait for value or error message 2752

Value? 2754

Process error message 2756

Notification information? 2710

Process information 2712

Condition information? 2714

Process information 2716

Status Message? 2718

Process message 2720

Attribute value? 2722

Process other information 2724

Receive additional information related to the value? 2726

Process value and additional information 2730

Process value 2728

Register for additional attributes? 2780

Register for one or more attributes of interest 2782

Unregister for registered attributes? 2776

Unregister one or more attributes of interest 2778

Continue? 2770

Unregister the registered attributes 2772

Unregister with CM 2774

END 2795

FOR 1324560

Context Server Routine

Fig. 28

